REMARKS

35 U.S.C. §103 rejections

With reference to pages 2-4 of the Office Action, claims 1, 3, 5, 6, 8-12, 15, 16, 18-24, 28, 31, 32 and 35-38 were rejected under 35 U.S.C. 103(a) as being unpatentable over Zarian et al (US 5,937,127) in view of Byler, Jr. et al (US 5,257,329).

The Examiner referred to figures 4-6 of Zarian as disclosing a side-scattering light guide comprising, amongst other things, "particles within the core, the particles being transparent, high optical transmittance low back reflectance and low [sic], and being distributed to scatter light being transmitted along the core so that at least some of the scattered light exits the sides of the core". The Examiner asserts that these particles are in some way analogous to the Applicant's use of "diffuser particles within the core". The Applicant respectfully disagrees.

Zarian discloses the use of a number of jacket layers around a light transmitting core cladded with a fluoropolymer to create an "aura effect" whereby a fiber-optic conduit can be made to appear larger than it actually is. Zarian's

disclosure is not directed to solving a similar problem to that of the Applicant.

Zarian, in fact, does not disclose the use of particles within the core. Zarian is completely silent on any form of particles within the light transmitting polymeric core. All of the embodiments discussed have a core which is cladded with a fluoropolymer cladding. This is then surrounded by a first jacket which itself may be surrounded by "an interlacing layer having an optical characteristic" (column 4 lines 42-45). Column 5 lines 3-4 also sets out that "the optical characteristic in the interlaced layer may be affected by the aura effect" as does column 5 lines 47-49 "the interlacing layer interposed between multiple layers of jackets desirably comprises an optical characteristic that is affected by the aura effect".

It should now be clear that it is the interlacing layer only which contains the optical characteristic and that this is separated from the core by a cladding layer and a first jacket. The Examiner in his report refers to column 3 lines 15-19 of Zarian as indicating particles within the core. With respect, this is not a correct reading of Zarian.

Column 3 lines 10-12 describe "… a layer having an optical characteristic, for example a hologram, surrounding the polymer jacket…" and then at lines 15-19 as referred to by the Examiner "Other linear light forms of the same arrangement are desired where the layer having the optical characteristic comprises other 'active optic elements' such as reflectors, reflective particles, dichroics, tapes, designs, letterings and the like". This reference to the layer having the optical characteristic which may contain reflective (not diffuser) particles is clearly a reference to the interlacing layer surrounding the polymer jacket as set out in column 3 lines 10-12 and not to the core as asserted by the Examiner.

Page 6 of the present application sets out that the side-scattering light guide comprises a core seeded with diffuser particles and claim 1 refers to "diffuser particles within the core". The diffuser particles within the core increase the chances of light rays escaping from the core to produce side scattered light with a "pleasing, bright, substantially uniform appearance". It is essential that the diffuser particles be within the core in the path of the light rays. As has been described, this is not the case with Zarian. The fact that the optical characteristic of Zarian is in a layer at least two layers removed from the core and that

this layer may not even be present in some embodiments, would not suggest to a person skilled in the art the use of the diffuser particles of the present application within the optically transmitting core.

The optical characteristic is also never described as necessarily having the properties of "being transparent, high optical transmittance low back reflectance and low [sic], and being distributed to scatter light being transmitted along the core so that at least some of the scattered light exits the sides of the core" i.e. all the properties of the diffuser particles of the present application which the Examiner has attributed to Zarian.

The optical characteristics of Zarian may be reflectors, reflective particles, dichroics etc as set out above. Column 4 lines 45-48 describe the interlacing layer having the optical characteristic as preferably being "a thin film which can be formed either continuously along the length of the fiber-optic conduit or at discrete intervals". This optical characteristic clearly cannot serve the same purpose as the diffuser particles of the present application.

Column 7 lines 1-3 of Zarian, and throughout the specification, assert that the optical characteristic is

designed to be part of the aura and to give the "appearance that the image projects out of the conduit when illuminated". Again, the optical characteristic of Zarian serves a very different purpose to the diffuser particles of the present application and their use to produce uniform, pleasing light from a side-scattering light guide would not be obvious to a person skilled in the art in light of Zarian.

Further, column 6 lines 16-18 of Zarian set out that "while the interlacing layer is desirable in many of the linear light applications, the interlacing layer is not necessary to produce the aura effect". Since the interlacing layer is the only layer having the optical characteristic this means that the optical characteristic is not essential for the successful working of the invention. The teaching of Zarian then, is not only that the optical characteristic be present in an outer layer rather than the core, but also that the optical characteristic is not necessary. The diffuser particles of the present invention on the other hand, are an essential feature to produce uniform, visually pleasing light as set out in the Applicant's disclosure.

The Examiner has also asserted that claim 18 of the present application is made obvious in light of the jackets of Zarian being "made of reflective materials or films".

Again, the only disclosure in Zarian relating to reflective materials or films is the interlacing layer as previously described. The jackets employed by Zarian are only ever described as being a "transparent or translucent polymeric jacket" (column 7 lines 14-18). The provision of a number of these jackets with different refractive indexes allows the light produced to give an aura effect around the conduit. It would be undesirable for the light conduits of Zarian to have reflective jackets and there is no disclosure of this.

The Examiner admitted that Zarian does not specifically disclose diffuser particles but asserts that Byler discloses this feature and that the use of diffuser particles by the Applicant was obvious over Zarian in view of Byler. The Applicant respectfully disagrees.

Byler discloses the use of microparticles within the optical core of an optical coupler to depolarise light from a highly polarised light source before it is transmitted into an optical switch. The problem solved is that of a modulator array requiring depolarised light as an input when the light source is highly polarised, such as from a laser. A person seeking to solve the problem of producing uniform, visually pleasing light, from a light guide, as in the present application, or trying to create an aura effect around a

fiber-optic conduit to increase the perceived size of the conduit, as with Zarian, would not look to the teaching of Byler for help i.e. the difference between the technologies are not inconsiderable.

The present specification, at page 3 lines 8-9, sets out that the diffuser particles are distributed to scatter light "so that at least some of the scattered light exits the sides of the core". Byler, at column 1 lines 53-59, sets out that after light hits the microparticles "the light is depolarized in a relatively short distance" i.e. the microparticles of Byler are provided for the purpose of depolarizing light efficiently.

Column 3 lines 54-59 of Byler recite that "most of the rays passing through the coupler will experience relatively small deflections. This is important because if light strikes optical cladding structure at an angle greater than the acceptance angle of the optical coupler, the light is lost through that cladding structure". This sets out that the direction of the light rays towards the sides of the core is an undesirable side effect of the microparticles. To confirm this, column 4 lines 43-46 recite that "a minority of the rays will be lost through optical cladding".

Page 7 line 24 to page 8 line 1 of the present application describes the purpose of the diffuser particles as being to increase the likelihood of light rays being deviated to achieve an angle such that they are more likely to exit the core. These rays then go on to be diffused by the jacket of diffusing material to emit light of the desired uniform appearance.

It should now be clear that Byler teaches away from the use of diffuser particles such as those used in the present application by stressing that light being deflected out of the optical coupler is a situation to be avoided and would represent a loss of efficiency in that particular system.

To further demonstrate the differences between the microparticles of Byler and the diffuser particles of the present invention, Byler puts a restriction on the number of microparticles present in the optical core when he says at column 2 lines 28-31 that "small concentrations of refractive and/or diffractive particles may be added to the suspension material of the optical mixing core". This is, presumably, so as to limit the amount of light which is deflected towards the sides of the optical core.

In the present application at page 12 lines 1-2 the Applicant sets out that a high concentration of diffuser particles may be used in the core. Again, this is because a certain level of deflection of light to the side (and then outside) of the core is essential. This is incompatible with the teaching of Byler. The microparticles of Byler are not diffuser particles. Byler has set out that diffusion i.e. the spread of light rays which results in them being more likely to contact the sides of the core, is undesirable. The microparticles are only there to depolarise highly polarised light and not specifically to diffuse light as with the present invention.

Therefore, it has been demonstrated that Zarian does not disclose any particles in the core nor any elements having all the features of the Applicant's diffuser particles. Byler also does not teach towards the use of light diffuser particles. Rather, Byler teaches the use of microparticles which can depolarise laser light but that bring about a minimum amount of diffusion since light rays which are deflected are effectively lost. Byler, therefore, teaches away from the use of the diffuser particles employed in the present invention.

Given the situation described above it should be appreciated that the use of diffuser particles in an optically transmitting core, as in the present application, would not have been obvious to a person skilled in the art who was aware of the disclosure of Zarian and Byler.

In light of the arguments presented above, it is submitted that all independent claims and the claims dependent thereon are both novel and non-obvious to a person skilled in the art at the time the invention was made in light of the prior art of record.

In view of the foregoing, it is respectfully submitted that each of the claims as now presented is in condition for allowance, which action is earnestly solicited. Should there be any remaining issues, Examiner is cordially invited to telephone the undersigned for a speedy resolution.

Respectfully submitted,

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